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⑤④ Long travel damper.

⑤⑦ A torsional vibration damper assembly to transmit torque between driving and driven elements has a hub assembly (26) operatively connected to torque output means and a housing (12) encompassing the hub assembly including sliding skates (42) located within the housing each including a circular hole (72) for reducing the mass of the skates and each including a radially outwardly located arcuate surface (62) engageable with a mating arcuate glide surface (64) on the encompassing housing for producing a controlled lag therebetween and wherein the radially outwardly located arcuate surface of each of the skates has cross-grooves (66) formed therein for flow of transmission fluid at the interface between the skate and the encompassing housing; the skates are urged radially outwardly into contact with the encompassing housing by centrifugal force and by the radial force of resilient spring means having an end coil (42a) configured to engage hub arm reaction surfaces (37) to produce a spring force precisely on the longitudinal axis of the resilient spring means which force is resolved by side surfaces (58, 60) on each of the skates to produce a uniform radial force between the arcuate surface thereon and the arcuate surface of the encompassing housing as the resilient spring means damp relative movement between the hub and the housing enclosure.

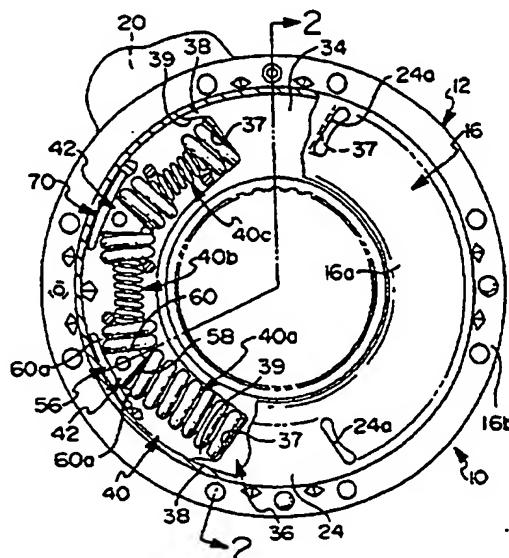


FIG 1

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# EUROPEAN SEARCH REPORT

Application Number

EP 91 30 4389

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. CL.5)
D,A	US-A-4 304 107 (FALL ET AL.) * abstract; figures 1,4 *	1	F16F15/12
A	EP-A-0 238 231 (BORG-WARNER) * abstract; claims 1-4,7-8; figures 1,4 *	1,2,6	
A	EP-A-0 110 553 (BORG-WARNER) * abstract; claims 1-6,9,10; figures 3,6,8 *	1	
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			TECHNICAL FIELDS SEARCHED (Int. CL.5)
			F16F F16D F16H
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>17 SEPTEMBER 1992</b>	Examiner <b>SCHMAL R.</b>
<b>CATEGORY OF CITED DOCUMENTS</b> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document I : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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